

Army Regulation 70-62

Research, Development, and Acquisition

Airworthiness Qualification of Aircraft Systems

**Headquarters
Department of the Army
Washington, DC
21 May 2007**

UNCLASSIFIED

SUMMARY of CHANGE

AR 70-62

Airworthiness Qualification of Aircraft Systems

This major revision, dated 21 May 2007--

- o Changes the title of the publication by removing the words U.S. Army.
- o Incorporates unmanned aircraft systems into the airworthiness processes and procedures throughout.
- o Adds the term "Maintenance Engineering Call" to include the policy and procedures throughout.
- o Deletes the term "Contractor Flight Release" throughout.
- o Deletes the term "Interim Statement of Airworthiness Qualification" throughout.
- o Provides policy provisions for those Army aviators operating other than U.S. Army aircraft (para 2-1).
- o Revises Airworthiness requirements for clarity (para 2-1j).
- o Revises Airworthiness release information for clarity and organization and deletes reference to the United States Army Aviation and Missile Command (chap 1 and para 3-7).
- o Updates appendix B to show airworthiness process elements.
- o Redefines the term "Aircraft system" to include unmanned aircraft systems (glossary).
- o Defines the term "engineering cognizance" (glossary).


Research, Development, and Acquisition

Airworthiness Qualification of Aircraft Systems

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:


JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army

History. This publication is a major revision.

Summary. This regulation implements Army policy for airworthiness qualification of aircraft systems, subsystems, allied equipment undergoing development, modifications added to Army aircraft, and in-flight operation of carry-on equipment that impacts or applies to airworthiness.

Applicability. This regulation applies to the Active Army, the Army National Guard/Army National Guard of the United

State, and the U.S. Army Reserve, unless otherwise stated.

Proponent and exception authority. The proponent of this regulation is the Deputy Chief of Staff, G–4. The proponent has the authority to approve exceptions or waivers to this regulation that are consistent with controlling law and regulation. The proponent may delegate this approval authority, in writing, to a division chief within the proponent agency or its direct reporting unit or field operating agency, in the grade of colonel or the civilian equivalent. Activities may request a waiver to this regulation by providing justification that includes a full analysis of the expected benefits and must include formal review by the activity’s senior legal officer. All waiver requests will be endorsed by the commander or senior leader of the requesting activity and forwarded through their higher headquarters to the policy proponent. Refer to AR 25–30 for specific guidance.

Army management control process. This regulation contains management control provisions in accordance with AR 11–2 but does not identify key management controls that must be evaluated.

Supplementation. Supplementation of

this regulation and establishment of command and local forms are prohibited without prior approval from the Office of the Deputy Chief of Staff, G–4 (DALO–SMV), 500 Army Pentagon, Washington, DC 20310–0500.

Suggested improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to the Commander, U.S. Army Research, Development, and Engineering Command, ATTN: AMSRD–AMR–AE, Redstone Arsenal, AL 35898–5000.

Distribution. Distribution of this publication is available in electronic media only and is intended for command levels B, C, D, and E for Active Army, the Army National Guard/Army National Guard of the United States, and U.S. Army Reserve.

Contents (Listed by paragraph and page number)

Chapter 1

Introduction, page 1

Purpose • 1–1, page 1

References • 1–2, page 1

Explanation of abbreviations and terms • 1–3, page 1

Responsibilities • 1–4, page 1

Chapter 2

Airworthiness Qualification, page 2

Airworthiness requirements for flight, other piloted, and test operations • 2–1, page 2

Airworthiness authority • 2–2, page 3

Requesting airworthiness release approval • 2–3, page 3

Basis for airworthiness determination • 2–4, page 4

*This regulation supersedes AR 70–62, dated 7 July 2000.

Contents—Continued

Airworthiness qualification process • 2-5, *page 4*

Risk management interfaces • 2-6, *page 5*

Assessing airworthiness impact • 2-7, *page 5*

Chapter 3

Airworthiness Documents, *page 6*

Section I

Types of Airworthiness Documents, page 6

Airworthiness release • 3-1, *page 6*

Airworthiness qualification substantiation record • 3-2, *page 6*

Statement of airworthiness qualification • 3-3, *page 7*

Airworthiness approval • 3-4, *page 7*

Airworthiness impact statement • 3-5, *page 7*

Maintenance engineering call • 3-6, *page 7*

Section II

Criteria for Airworthiness Document Application, page 7

Airworthiness release • 3-7, *page 7*

Statement of airworthiness qualification application criteria • 3-8, *page 8*

Airworthiness approval application criteria • 3-9, *page 8*

Appendixes

A. References, *page 9*

B. Air Worthiness process elements, *page 10*

Figure List

Figure B-1: Airworthiness element flow, *page 10*

Glossary

Chapter 1 Introduction

1-1. Purpose

This regulation prescribes the policies, responsibilities, processes and/or procedures for airworthiness qualification and system specification compliance of manned and unmanned aircraft systems and subsystems, including the installation of allied equipment and modifications to Army aircraft. Army aircraft as used herein includes all aviation materiel and aircraft that are Army assigned, bailed, borrowed, loaned, leased, owned, or otherwise authorized for operation by Army personnel, or after modification under an Army contract.

1-2. References

Required and related publications and prescribed and referenced forms are listed in appendix A.

1-3. Explanation of abbreviations and terms

Abbreviations and special terms used in this regulation are explained in the glossary.

1-4. Responsibilities

a. Deputy Chief of Staff, G-4. The Deputy Chief of Staff, G-4 will—

- (1) Be the proponent for airworthiness of Army aircraft.
- (2) Ensure the integrity and independence of the airworthiness approval mission by petitioning for an adequate level of resources to support organic airworthiness functions. These include, as a minimum, establishing airworthiness requirements, assessment of design compliance from verification results, and airworthiness approvals.

b. Commanding General, U.S. Army Materiel Command. The Commanding General, U.S. Army Materiel Command (CG, AMC) will—

- (1) Exercise staff supervision for airworthiness qualification within the Army.
- (2) Ensure that product improvement programs (PIP) for aircraft systems and their major components include appropriate efforts for airworthiness qualification.
- (3) Ensure that approved configurations of aircraft systems, including officially promulgated modification work orders (MWO), have been determined to be airworthy before issuing the item to the user.

c. Commanding General, U.S. Army Aviation and Missile Command. The Commanding General, U.S. Army Aviation and Missile Command (CG, USAAMCOM), is the Army's airworthiness approval authority. The CG, USAAMCOM will—

- (1) Develop and implements a fully coordinated program for airworthiness qualification for aircraft systems, subsystems, and allied equipment.
- (2) Review all planned Army aircraft development programs; off-the-shelf procurements; alterations to systems, subsystems, and allied equipment affecting airworthiness to establish requirements for airworthiness qualification.
- (3) Identify and coordinates appropriate test requirements with those agencies that will witness or confirm that the airworthiness qualification and system specification compliance data is valid and documented.
- (4) Grant engineering approval for individual documents that are needed for airworthiness qualification of aircraft systems, subsystems, and allied equipment.
- (5) Issue the official notice of airworthiness release for Army tests or operations and statement of airworthiness qualification for Army materiel release, together with the applicable flight envelope and specific operating and maintenance instructions. This notice includes—

(a) Approval of all qualification data published in technical manuals for the system including all electronic rendition of this data in flight, planning and maintenance devices.

(b) Procedures, cautions, warnings, limitations, and performance data.

(6) Ensure that the maximum degree of safety is applied through the practical application of systems safety engineering.

(7) Establish and maintain a single airworthiness office with engineering cognizance and delegated authority for the execution of all Army airworthiness qualification and continued airworthiness actions except those specifically authorized per paragraph 1-4c (8) below. Provide a single point of contact between the Army and other agencies (such as the Federal Aviation Administration, the National Aeronautics and Space Administration, the U.S. Air Force, and the U.S. Navy) performing qualification or certification tasks on Army aviation materiel.

(8) Issue appropriate delegation of authority to activities with mission requirements for prototype or unique aircraft systems that have adequate procedures in place and engineering cognizance of the aircraft system commensurate with the requested authority.

d. Commanding General, U.S. Army Research, Development, and Engineering Command. The Commanding General, U.S. Army Research, Development, and Engineering Command (CG, USARDECOM) will ensure capable and relevant aviation engineering resources are available to implement technology insertion, implement and sustain engineering cognizance, and perform other engineering functions of the airworthiness authority's mission.

e. Commanding General, U.S. Army Security Assistance Command. The Commanding General, U.S. Army Security Assistance Command (CG, USASAC) will ensure foreign military sales cases for aviation materiel include appropriate airworthiness provisions.

f. Commanders of major subordinate commands and commanders of separate installations and activities reporting directly to Headquarters, AMC. These commanders will participate in and furnish personnel to support airworthiness evaluations on aircraft systems, subsystems, or aircraft allied equipment under their cognizance.

g. Heads of appropriate Army activities, program executive office, program managers, project managers, and product managers. The head of each appropriate Army activity and program executive office, program manager, project manager, or product manager (when they develop or modify aircraft, aircraft allied equipment, or carry-on equipment for in-flight operation) will—

(1) Fund for development of the system design, design documentation, and verification activities to generate airworthiness data.

(2) Ensure that the airworthiness requirements of the Army or other applicable airworthiness authority have been met.

(3) Ensure all other regulatory requirements, such as spectrum management clearances, are met.

(4) Obtain airworthiness release prior to fielding the aircraft system.

h. Operational unit commanders. All commanders of operational units will ensure that—

(1) An airworthiness release is requested through their major Army higher headquarters and material developer and is obtained before modifying or using any aircraft incorporating a modification (see para 2-7) to the qualified or standard configuration assessed as impacting airworthiness.

(2) A copy of all applicable airworthiness releases are located in the aircraft logbook or equivalent unmanned aircraft record during its operation and when it is transferred, until the document is superseded, or the aircraft system is restored to the unmodified qualified or standard configuration.

Chapter 2

Airworthiness Qualification

2-1. Airworthiness requirements for flight, other piloted, and test operations

a. Army aviators and unmanned aircraft system operators will not operate aircraft in the performance of official duties if there is no airworthiness release or airworthiness approval.

(1) For all Army-owned aircraft, the airworthiness release approval will be issued by the Army airworthiness authority or appointed delegate.

(2) For aircraft not owned by the Army, but certified by and maintained in accordance with an organization identified in paragraph 2-2*b*, Army aviators and unmanned aircraft systems operators may operate those aircraft within the prescribed limits and other guidance of the issuing agency.

(3) Army aviators and unmanned aircraft system operators may operate aircraft under the airworthiness release provided as service guidance to contractors flight and ground operations when specifically authorized by their unit (normal briefing structure) and verified (as required flight) by the government flight representative per AR 95-20, enclosure 4.

b. Requests for exceptions to paragraph 2-1*a* are as follows:

(1) Army aviators and unmanned aircraft system operators planning to operate other than U.S. aircraft that may not meet U.S. airworthiness standards, must request a waiver from the Office of the Deputy Chief of Staff, G-4 (DALO-ORR-ER), 500 Army Pentagon, Washington DC 20310-0500. If the request is granted, the requesting units higher headquarters Commander, or another U.S. Government Agency's functional equivalent may extend such authorization to additional occurrences within the original exception bounds.

(2) Authority to grant extensions will not be delegated below the grade of Colonel (O6). Such authorization will be appropriately limited (for example, to an event, duration, or location) and documented with rationale (for example, mission need, suitability, and availability) for waiving the requirement.

c. All modifications impacting airworthiness (see para 2-7) will subject the aircraft system, subsystem or allied equipment to re-qualification. The cognizant engineering airworthiness authority will be consulted in the determination of which modifications would or would not measurably affect the airworthiness of an aircraft system, subsystem or allied equipment.

d. A new or revised airworthiness release is required for all modifications impacting airworthiness (see para 2-7) of Army aircraft operating on an airworthiness release. Issuance of an airworthiness release is based on a technical data review and/or inspection of the installed modification.

e. A new or revised airworthiness approval is required for modifications impacting airworthiness (see para 2-7) of Army aircraft operating on an airworthiness approval (for example, a Federal Aviation Administration type certification of off-the-shelf aircraft). The airworthiness approval is required prior to first flight and the Army configuration,

installation, and intended usage (flight profile and environments) are required to be within the scope of the approval. Issuance of the airworthiness approval is based on the technical data requirements established by the agency that exercises engineering cognizance over the aircraft system.

f. An airworthiness release is required as supplemental service guidance for contractors flight and ground operations (see definitions in AR 95–20) of an Army aircraft.

g. Development or adoption of commercial off the shelf (COTS), carry-on equipment with a mission requirement for operation in-flight will include an airworthiness assessment (see para 2–7*b*). The airworthiness authority will be consulted in the determination of which operation of carry-on equipment would or would not measurably affect the airworthiness of an aircraft system, subsystem or allied equipment. Based on the assessment, a determination will be made of the extent of airworthiness qualification and appropriate documentation required for in-flight operation.

h. Adoption of COTS equipment for Army aviation use will include an airworthiness assessment (see para 2–7*c*). Based on the assessed airworthiness impact, the appropriate airworthiness qualification and an airworthiness release will be required for installation and operation of the COTS equipment.

i. A statement of airworthiness qualification is required input to the materiel release process for all aircraft systems and modifications undergoing materiel release to operational units.

j. When the Army plans to adopt or adapt the airworthiness approval/certification of a system/subsystem, component or similar item (for example, Technical Standard Order (TSO) component, commercial engine or related airworthiness data) from another agency for use on Army aircraft, the below situations will require the Army airworthiness authority to receive approval from the agency issuing that airworthiness approval/certification. Once the other agency's airworthiness approval/certification is incorporated into a new Army airworthiness release, all Army-owned aircraft and unmanned aircraft systems will use the new Army issued airworthiness release. This new release can be implemented for Army use or Army qualification as desired by the Army airworthiness authority. Army qualification and airworthiness release adaptation of the other agency's approval—

(1) Is required to support the flight test program.

(2) Is required to fill all gaps between the scope of the previously approved version and the Army configuration, installation, and intended usage (flight profile and environments).

(3) Will utilize existing technical data, from the contractor or other agency, if made available and determined to be compatible with Army usage. Supplemental new data may be required to fill in the gaps between the existing approved limits and Army intended usage.

(4) May have to repeat previous simulations, tests, and analyses with different Army environments, profiles and configuration differences to determine prescribed limits for Army usage.

2–2. Airworthiness authority

a. The CG, USAAMCOM, is the Army's airworthiness approval authority. Airworthiness approval will result from a demonstrated capability of an aircraft or aircraft subsystem or component, including modifications, to function satisfactorily when used and maintained within prescribed limits as determined by an engineering cognizant activity.

b. Other recognized organizations from which airworthiness data may be adopted are the Federal Aviation Administration, the National Aeronautics and Space Administration, the U.S. Air Force, the U.S. Navy, or a foreign organization to the extent their proposed airworthiness data has been accepted by a U. S. agency. The appropriate source is the one exercising engineering cognizance over the aircraft. Adopted data may include approvals that result from a demonstrated capability to function satisfactorily when used within prescribed limits found suitable for Army use and be in the form of any technical document that provides operating instructions and limitations necessary for safe operation and flight of an aircraft system, subsystem or allied equipment.

c. Army airworthiness approval applies to foreign military sales aircraft on Army contract prior to transfer to the foreign military sales customer and for U.S. military pilot operation in CONUS. On a reimbursable basis, an airworthiness assessment and recommended operating limits can be provided for foreign military sales customers use in making their own airworthiness approval determination.

2–3. Requesting airworthiness release approval

a. Requests for airworthiness releases, and statements of airworthiness and qualification for Army aircraft will be forwarded to the Commander, USARDECOM, AMSRD–AMR–AE, Redstone Arsenal, AL 35898–5000. Requests normally will come through the materiel developer (such as, the Program Executive Office or the system's program/project/product manager) or from the field through the applicable Army Command (ACOM), Army Service Component Command (ASCC) or Direct Reporting Unit (DRU) and materiel developer.

b. Exceptions to paragraph 2–3*a* are requests for airworthiness approval for major modifications installed on aircraft with airworthiness authority either other than the Army or from a specifically authorized Army activity (see para 1–4*c*(8)). These requests will be forwarded to the appropriate engineering cognizant agency (such as, the Federal Aviation Administration, the National Aeronautics and Space Administration, the U.S. Air Force, or the U.S. Navy).

2-4. Basis for airworthiness determination

a. The first basis for an airworthiness determination is the complete collection of aeronautical design standards covering the engineering of aircraft systems and subsystems design and performance. The standards address individual systems and subsystems, their integration, and the integrated system of hardware with applicable software and crew in the loop. Aeronautical design standards provide an effective means for documenting current technology that is essential in the evaluation for airworthiness qualification. This collection includes—

- (1) Military and Federal civil agency specifications, standards, and handbooks.
- (2) Industrial specifications and standards (such as, those published by nationally recognized associations, committees, and technical societies), having coordinated status established under Department of Defense policies and procedures.
- (3) Company specifications and standards when such documents are based on Government or industrial standards or are supported by technical evidence (such as analysis, test or operational results) of their effectiveness.
- (4) Design handbooks recognized by the engineering discipline.
- (5) Published design criteria based on past experience.
- (6) Published test and evaluation procedures and criteria.

b. The second basis for airworthiness determination is prescribed limits covering the full range of limitations for the safe and reliable use and maintenance of the aircraft system, subsystem, or allied equipment as determined by analysis, tests, and operating experiences. These limitations include those covering crew requirements and—

- (1) Flight limits, such as airspeed; maneuvering; electromagnetic environment; and environmental restrictions on altitude, temperature, and other weather conditions.
- (2) Loading limits, including weight, center of gravity, fuel load, cargo, external store, and armament loadings.
- (3) Structural life and wear limits that are critical to continued safe operation.
- (4) Propulsion system limits such as propeller, rotor, and engine subsystem rotational speeds and start-up, shutdown, torque input, torque output, fuel grades, lubrication system temperature, and pressure limits.
- (5) Subsystem limits such as electrical load limitations and operating restrictions during degraded mode flight such as single boost or with automatic flight control system inoperative.

c. The basis for continued airworthiness determination is—

- (1) Operation within prescribed limits and application of appropriate remedial action (inspection, repair, replacement) for any excursions outside limits.
- (2) Maintenance that is current and compliant with established maintenance procedures including intervals and conditions for inspection, replacement, and overhaul that are required for sustaining the properties and performance of the aircraft.
- (3) Aviation critical safety item (CSI) controls, in addition to normal parts acquisition controls, to ensure the airworthiness of those parts that have catastrophic consequences of failure.

d. The applicable criteria for unmanned aircraft airworthiness determination may vary with categories of unmanned aerial vehicles such as those that account for feasibility of implementation, Army ground and flight risk, and mission needs.

2-5. Airworthiness qualification process

a. Elements of the airworthiness process are diagramed in appendix B to assist in understanding how these elements are related. Airworthiness qualification procedures will make maximum use of recognized sound technical and management techniques. Aeronautical design standards establish the criteria used in qualification of aircraft as set forth in this regulation. Techniques used generally will be—

- (1) Engineering analysis, modeling, and simulations.
- (2) Formal inspections, design reviews, and safety assessments.
- (3) Contractor flight and ground development tests.
- (4) Component qualification test of performance under specified conditions and duration.
- (5) Formal contractor demonstrations.
- (6) Government testing.

b. An airworthiness qualification specification for the total system will be published and made an integral part of the requirements document and its resulting contract. All qualification requirements for subsystems and components will also be included in this specification or be referenced in the specification.

c. Analyses, simulations, and testing will be conducted to demonstrate or verify compliance with applicable aeronautical design standards, demonstration addendum, and other technical characteristics cited in contracts. Airworthiness qualification testing will be integrated with contractor and other Government testing. The coordinated test program (CTP) will reflect the integration and results. Included, as applicable, will be—

- (1) Allied equipment testing.
- (2) Subsystems or component testing.
- (3) Total systems testing, including flight tests and demonstrations.

- (4) Analytical design substantiating reports.
- (5) Software verification.

d. Airworthiness qualification and technical safety data requirements will be included in requests for proposals and invitations for bids. Appropriate data items will be obtained from the data item descriptions listed in Acquisition Streamlining and Standardization Information System (ASSIST). The address to ASSIST is <http://assist.daps.dla.mil>. These data requirements will be made a part of the applicable contract.

e. The design and performance criteria to be substantiated for airworthiness qualification will be established. These criteria will be included in the detailed specification or system description, and the airworthiness qualification data and demonstration requirements will be included in an airworthiness qualification specification for the aircraft.

f. Design and test guidance pertaining to airworthiness qualification and airworthiness releases will be provided to contractors, as required, through procurement channels.

g. If the proposed air item is determined not to be airworthy, the airworthiness authority will immediately inform the appropriate agencies, citing specific reasons for disapproval and providing recommendations for further action to make qualification possible. In the case of developmental standard aircraft, this notification will include the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (SAAL-SA), 103 Army Pentagon, Washington, DC 20310-0103; special mission aircraft notification will include the Deputy Chief of Staff, G-4 (DALO-SMV), 500 Army Pentagon, Washington, DC 20310-0500; and the Deputy Chief of Staff, G-3/5/7, DAMO-FDI (for intelligence missions), ATTN: MOSO-SOD (for special operations missions), or DAMO-FDV (for all other missions), all at 400 Army Pentagon, Washington, DC 20310-0400). The CG, AMC, will be kept abreast of sensitive areas between the airworthiness authority and industry or commodity commands.

h. An airworthiness qualification substantiation record will be generated during the airworthiness qualification program and made available for submittal with the statement of airworthiness qualification. This record will contain, but not be limited to, the following:

(1) The degree of compliance with the design and performance criteria of the detailed specification or system description on a paragraph-by-paragraph basis.

(2) Consolidation of all significant airworthiness data accumulated during the testing conducted by the contractor and the qualifying agency.

(3) Documentation of all operating limitations, fatigue life of critical components, cautions, and warnings, together with technical justification.

i. Necessary procedures, placards, limitations, cautions, performance data, and so forth, obtained during the airworthiness qualification program will be published in technical manuals for applicable systems.

j. To preclude duplication of effort, an adequate file will be maintained of each airworthiness qualification completed. Copies of pertinent documents also will be furnished to the cognizant engineering project office and, if required, the program, project, or product manager.

k. The airworthiness release for fielded Army aircraft will require reporting the modification per DA PAM 738-751, chapter 2 and updating the weight and balance records per AR 95-1 or AR 95-23, chapter 7. All other airworthiness releases will require the same or equivalent reporting.

l. The prescribed limits in an airworthiness release for modified aircraft have precedence over limits in the technical manual (TM) until the aircraft is restored to the standard or qualified configuration or the revised limits are published in the applicable manuals.

2-6. Risk management interfaces

a. Statements of airworthiness qualification and airworthiness releases are not a means to accept risk. Any issue that significantly degrades airworthiness, any identified hazard that has a significant residual risk, unresolved conflicts between airworthiness and performance requirements, or any event that indicates such issue or hazard probably exists will generate an airworthiness impact statement. The airworthiness impact statement is a means to notify the appropriate decision makers and track the impact until resolved. The airworthiness impact statement will be included in the qualification documentation.

b. Any residual risk from an airworthiness impact statement or otherwise identified by the system safety risk determination process and the results of any subsequent approved System Safety Risk Assessments (SSRA) per AR 385-16, paragraph 5*q* and appendix B will be included in the documentation supporting statements of airworthiness qualification and airworthiness release.

c. If the airworthiness status changes after qualification and operational fielding, an airworthiness impact statement will be generated and used to prepare a Safety or Maintenance message (if applicable) to notify the users per AR 750-6.

2-7. Assessing airworthiness impact

a. Modifications will be assessed for airworthiness impact. Airworthiness impact is the measurable effect that added or modified equipment and its installation has on the airworthiness of the aircraft system, subsystem or allied equipment. Modifications that impact airworthiness include—

(1) Changes that affect structural integrity, propulsion/drive system operation, aircraft performance, aerodynamic characteristics (including drag, control response, and stability), electromagnetic characteristics, navigational system effectiveness, flight control system power requirements and effectiveness, weight and balance of an air item, air crew station noise levels, restrict air crew vision or performance, or increase the danger to the crew in the event of an accident.

(2) Changes that energize emission of electromagnetic energy that can affect any aircraft, subsystem or allied equipment controls, indicators, displays, or the navigational and communication systems effectiveness.

(3) Changes that emit light or sound energy that can raise air crew station noise levels, or distract and degrade air crew performance.

(4) Changes that can be energized to emit any form of radiation, gases, liquids, or debris that may be hazardous, such as explosive ordnance, explosive or flammable fluids, laser energy, and so forth.

(5) Changes that with their intended use would be in lieu of a standard aircraft system, subsystem, or component function.

(6) Changes that affect the operating limits and/or emergency procedures prescribed by the military operators technical manual.

(7) Changes that affect the prescribed limits for continued airworthiness. These changes include additions, deletions, or reconfiguration of hardware and material substitutions, software revisions, and any repair or replacement not authorized in the technical manual.

(8) Changes that are not secured to structure to withstand the aircraft's existing static, dynamic and crash loads, thereby increasing the danger to the operator and crew in the event of an accident.

b. Operation of carry-on equipment with a mission requirement for operation in-flight will be assessed for airworthiness impact. Airworthiness impact occurs when operation of that equipment can measurably affect the airworthiness of the aircraft system, subsystem or allied equipment. These include—

(1) Operation of carry-on equipment that causes any impact as described in paragraphs 2–7*a* (1) through (8).

(2) Operation of carry-on equipment that cannot be secured with existing cargo restraints while in use, thereby increasing the danger to the operator and crew in the event of an accident.

c. Commercial off the shelf equipment adopted for Army aviation use will be assessed for airworthiness impact. The assessment will include—

(1) Review of any existing airworthiness approval for potential adoption if applicable to the Army system.

(2) Determination of the airworthiness qualification impact of the COTS equipment and its installation on the authorized configuration.

d. Any issue that significantly degrades airworthiness, any identified hazard that has a significant residual risk, unresolved conflicts between airworthiness and performance requirements, or any event that indicates such issue or hazard probably exists will be documented in an Airworthiness Impact Statement (AWIS).

Chapter 3 Airworthiness Documents

Section I Types of Airworthiness Documents

3–1. Airworthiness release

An airworthiness release is a technical document that provides operating instructions, procedures, limitations, inspections, and maintenance instructions necessary for safe flight of an aircraft system, subsystem, or allied equipment. This Army airworthiness approval is—

a. Based on the results of modeling and simulation, design analysis, engineering ground test, and/or flight test.

b. Required prior to operation of a new aircraft system, subsystem, or allied equipment or a modification (see para 2–7) to the qualified or standard configuration.

c. Incrementally expanded to control prudent flight envelope exploration for new development.

d. The service guidance when provided for contractors flight and ground operations. (See AR 95–20, para 4.3.4).

3–2. Airworthiness qualification substantiation record

An airworthiness qualification substantiation record is a document, spreadsheet, database or equivalent record generated during the airworthiness qualification program. The record will be completed and made available for submittal with the statement of airworthiness qualification to the Army materiel release. This record will contain, but not be limited to, the following:

a. The degree of compliance with the design and performance criteria of the detailed specification or system description on a paragraph-by-paragraph basis.

b. Consolidation of all significant airworthiness data accumulated during the testing conducted by the contractor and the qualifying agency.

c. Documentation of all operating limitations, fatigue life of critical components, cautions, and warnings, together with technical justification.

3-3. Statement of airworthiness qualification

A statement of airworthiness qualification is a document establishing the airworthiness qualification and system specification compliance status achieved. Aircraft performance is constrained by airworthiness limits in determining compliance. The statement of airworthiness qualification is issued in conjunction with a copy of the current Airworthiness Qualification Substantiation Record. This statement is based on final results of engineering tests conducted on the aircraft and its subsystem or allied equipment. Issuance of this statement is input to Army materiel release and typically coincides with type classification Standard A, if applicable, and normally completes the airworthiness qualification program. Since all of the prescribed limits are provided to operational units in the technical manuals, an abbreviated airworthiness release referencing those manuals can be provided to be kept with individual aircraft records.

3-4. Airworthiness approval

An airworthiness approval is any technical document that provides operating instructions, procedures, and limitations necessary for safe flight of an aircraft system, subsystem, or allied equipment. This document is issued by the airworthiness authority agency (such as the Federal Aviation Administration, the National Aeronautics and Space Administration, the U.S. Air Force, the U.S. Navy, or a foreign authority whose airworthiness approval has been accepted by a U.S. agency) exercising engineering cognizance over the aircraft system for which the airworthiness approval is granted. This approval is—

a. Based on the results of modeling and simulation, design analysis, engineering ground test, and/or flight test.

b. Required prior to operation of a new aircraft system, subsystem, allied equipment, or a modification (see para 2-7) to the qualified or standard configuration.

3-5. Airworthiness impact statement

An airworthiness impact statement is used to communicate airworthiness impact, the associated consequences, and probability of outcomes to decision makers as the result of an airworthiness issue, event or hazard. The airworthiness impact statement is prepared to document any issue that significantly degrades airworthiness, any identified hazard that has a significant residual risk, unresolved conflicts between airworthiness and performance requirements, or any event that indicates such issue or hazard probably exists. The document includes an issue description, impact, customer comments, background, consequences, probability, analysis uncertainty, alternatives, alternative comparison, and recommendation. The airworthiness impact statement may be used as input to any one or more processes such as: issue resolution, Executive summary (EXSUM), safety or maintenance message (if applicable), system safety risk assessment (SSRA) or serve as the basis for a change to operational or specification requirements.

3-6. Maintenance engineering call

A maintenance engineering call (MEC) will be used to address deviations from prescribed maintenance procedures/inspection criteria, processes and/or procedures in the appropriate maintenance technical manual (hard copy and electronic media, all versions) for the end item. The MEC will be retained in aircraft historical records and the aircraft logbook as long as the deviation is in effect. Users of the Unit Level Logistics System – Aviation Enhanced (ULLS-AE), will retain a PDF or HTML version of the MEC in the database indefinitely. MECs will—

a. Only be produced, authorized and issued by the Aviation Engineering Directorate, U.S. Army Research and Development Command (AED RDECOM) or their designated representative.

b. Direct maintenance personnel to record the deviation on DA Form 2408-15 or applicable historical record.

c. Require an evaluation by the AED RDECOM or their designated representative for any item, practice or criteria that impacts aircraft airworthiness.

d. Provide deviations for specific units and/or agency, model design series (MDS), and aircraft tail numbers or unmanned aircraft system related system or subsystem model number to include series (if applicable).

e. Require a periodic review by using units and AED RDECOM to insure that changes to existing maintenance procedures are not required.

f. Specify valid time frame (start data/end date) (may be extended or shortened via an addendum issued by authorized agency identified in a above).

Section II

Criteria for Airworthiness Document Application

3-7. Airworthiness release

a. An airworthiness release will only apply to new aircraft systems, subsystems, allied equipment, modifications or

nonstandard systems that are not currently covered by an existing airworthiness release, airworthiness approval by another agency or incorporated in a temporary (interim) or a special mission specific change.

b. An airworthiness release will not be used for the purpose of notifying agencies or units of changes to the airworthiness status of standard equipment (including changes to prescribed limits) where a Safety or Maintenance message is applicable per AR 750–6.

c. For Army contracts that require contractor’s flight and ground operations, an airworthiness release is mandatory service guidance, provided through procurement channels. This particular airworthiness release will include instructions and limitations (service guidance) for operations that are authorized by the Government flight representative (See AR 95–20, para 4.3.4). Agencies using existing Army approved documents, identifying specific system configurations and scope of operation may continue to use those documents until the new release is issued.

d. An airworthiness release will authorize Army test pilots to conduct preliminary airworthiness evaluations, airworthiness and flight characteristics tests, and other Government flight tests. Additionally, an airworthiness release will authorize Army pilots to conduct operational testing that may be necessary to complete qualifications.

e. An airworthiness release will provide authorization to use and incorporate interim changes to any applicable operating procedures and prescribed limits, including new requirements from modification work orders until the applicable technical manuals are updated.

f. Adopting an airworthiness approval by another agency for a new airworthiness release for Army-owned aircraft and for derivative changes under Army engineering cognizance and airworthiness authority is authorized.

g. An airworthiness release is only valid when the specific system covered by the airworthiness release is operated by Army crew members.

3–8. Statement of airworthiness qualification application criteria

a. The aircraft system, subsystem, allied equipment, or modification has reached a state of qualification to both the customer’s and airworthiness requirements.

b. The aircraft system configuration is being fielded through the Army materiel release as type classified standard materiel.

c. The aircraft system will be operated by Army crew members.

d. The Airworthiness Qualification Substantiation Record is complete.

e. This statement normally completes the full qualification process ending the airworthiness qualification program, but may be issued to document the current status when an early materiel release is requested by the user.

f. This statement should be revised to add officially promulgated modification work orders to the standard configuration.

3–9. Airworthiness approval application criteria

Airworthiness approval should be requested when—

a. Another agency has engineering cognizance of the aircraft system and not Army-owned aircraft.

b. Modifications to meet Army requirements are within the original airworthiness authority’s purview and authorization (for example the FAA does not provide airworthiness approval to fire weapons).

c. The aircraft system will be maintained to meet the cognizant airworthiness authority’s requirements for continued airworthiness.

Appendix A References

Section I Required Publications

AR 95-1

Flight Regulations (Cited in para 2-5k.)

AR 95-20

Contractor's Flight and Ground Operations (Cited in para 3-1d.)

AR 385-16

System Safety Engineering and Management (Cited in para 2-6b.)

AR 750-6

Army Equipment Safety and Maintenance Notification System (Cited in para 2-6c.)

DA PAM 738-751

Functional Users Manual for the Army Maintenance Management System-Aviation (TAMMSA) (Cited in para 2-5k.)

Section II Related Publications

A related publication is a source of additional information. The user does not have to read a related publication to understand this regulation.

AR 11-2

Management Control

AR 25-400-2

The Army Records Information Management System (ARMIS)

AR 70-1

Army Acquisition Policy

AR 70-25

Use of Volunteers as Subjects of Research

AR 700-138

Army Logistics Readiness and Sustainability

AR 750-1

Army Materiel Maintenance Policy and Retail Maintenance Operations

Section III Prescribed Forms

This section contains no entries.

Section IV Referenced Forms

The following form is available on the APD Web site at www.apd.army.mil.

DA Form 2408-15

Historical Record for Aircraft

Appendix B
Air Worthiness process elements

B-1. Describes the airworthiness elements flow

This diagram below maps the airworthiness elements from requirements generation to the end or fix.

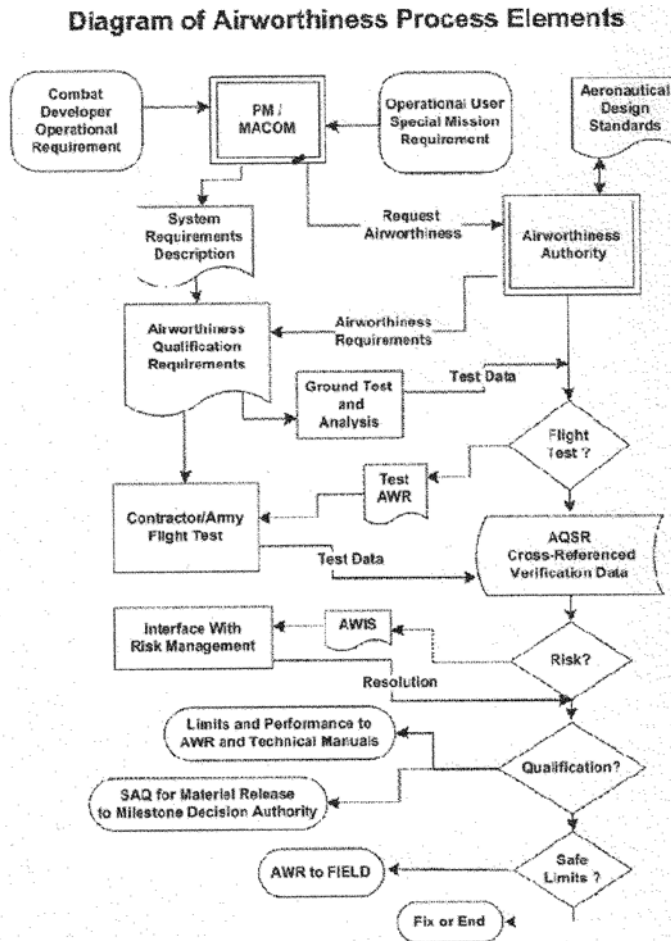


Figure B-1. Airworthiness element flow

B-2. Airworthiness elements flow

Airworthiness process elements and flow above represent control measures to support engineering cognizance.

Glossary

Section I Abbreviations

ACOM

Army Command

AMC

United States Army Materiel Command

ASCC

Army Service Component Command

ATTN

Attention (used in addresses followed by a name or office symbol)

CG

Commanding General

COTS

commercial off the shelf

CTP

coordinated test program

DA PAM

Department of the Army pamphlet

DCS, G-4

Deputy Chief of Staff, G-4

DOD

Department of Defense

DRU

direct reporting unit

FAA

Federal Aviation Administration

HQDA

Headquarters, Department of the Army

MWO

modification work order

PIP

Product Improvement Program

SSRA

system safety risk assessment

TM

technical manual

TSO

technical standard order

UAS

unmanned aircraft systems

USAAMCOM

United States Army Aviation and Missile Command

USAR

United States Army Reserve

Section II

Terms

Aircraft allied equipment

Equipment that is installed as an integral part of an aircraft system but is not required for flight (for example, a weapon that is attached to an aircraft).

Aircraft subsystem

Equipment that is installed as an integral part of an aircraft system that, if inoperable or removed, will prevent the aircraft from flying or make it unsafe (for example, helicopter tail rotor assembly).

Aircraft system

A self-powered controlled flight vehicle excluding ground effect machines and missiles.

Army aviator

Army personnel possessing an aeronautical designation awarded by the army authorizing them to pilot Army aircraft when ordered to do so by competent authority and with current flight status.

Army headquarters

Term used to identify higher headquarters which includes: Army commands, Army service component command, direct reporting units, the National Guard Bureau, field operating agencies and staff supporting agencies.

Modification

Any alteration, after production, to an item of materiel type classified standard A, standard B, or limited production, made by either Government or contractor personnel. Activities commonly known as retrofit, conversion, remanufacture, design, change, engineering change, and the like are included in the definition.

Technical manual

A manual providing detailed treatment of specific subjects considered necessary for the full accomplishment of required training. A technical manual also contains descriptions of materiel and instructions for the operation, handling, and maintenance and repair thereof, information and instructions on technical procedures, exclusive of those of an administrative nature.

Section III

Special Abbreviations and Terms

AQSR

Airworthiness Qualification Substantiation Report

AWR

Airworthiness Release

AWIS

Airworthiness Impact Statement

SAQ

Statement of Airworthiness Qualification

Aeronautical design standards

A complete collection of current technology design standards covering the engineering of aircraft systems and subsystems (including hardware with applicable software and crew in the loop) design, integration, and performance.

Airworthiness

A demonstrated capability of an aircraft or aircraft subsystem or component to function satisfactorily when used and maintained within prescribed limits.

Airworthiness release

A technical document that provides operating instructions and limitations necessary for safe flight of an aircraft system, subsystem, or allied equipment.

Airworthiness approval

Any technical document issued by an airworthiness authority that provides operating instructions and limitations necessary for safe flight. As used herein it refers to approval from an airworthiness authority other than the Army.

Airworthiness authority

A U.S. Government agency having engineering cognizance over a particular aircraft system, subsystem, or component and responsibility for determining the capability of that aircraft system, subsystem or component to function satisfactorily when used within prescribed limits. Also includes any foreign authority whose airworthiness approval has been accepted by a U.S. agency described above.

Airworthiness Qualification Substantiation Record

A technical summary describing the scope of the qualification and its results, including prescribed limits, and a compilation of each requirement indexed to its status of demonstrated compliance and references to the verifying technical substantiation (including analysis, inspections, drawings, modeling, simulations, test plans and test results, and any other relevant technical data).

Carry-on equipment

Any portable device that can be hand carried on-board by crew or passenger for the purpose of its operation in-flight.

Engineering cognizance

The technical awareness and knowledge of the design function and performance sufficient to determine prescribed limits required for safe operation and continued airworthiness.

Flight, other piloted, and test operations

All operation of the aircraft that includes intentional take-off and flight, certain ground operations where a pilot is required at the controls, and any experimental or engineering test necessary to determine limits. For rotary wing aircraft this includes ground operation of the aircraft's main engine or engines.

Prescribed limits

The full authorized range or envelope of operating, environmental, and sustaining criteria or characteristics for the safe and reliable use of the aircraft system, subsystem, or allied equipment as determined by analysis, tests, and operating experiences.

Statement of Airworthiness Qualification

A document establishing qualification status and airworthiness release that is issued in conjunction with the Airworthiness Qualification Substantiation Record normally completing an airworthiness qualification program.

UNCLASSIFIED

PIN 014856-000

USAPD

ELECTRONIC PUBLISHING SYSTEM
OneCol FORMATTER WIN32 Version 238

PIN: 014856-000

DATE: 05-21-07

TIME: 11:45:09

PAGES SET: 17

DATA FILE: C:\Wincomp\r70-62.fil

DOCUMENT: AR 70-62

SECURITY: UNCLASSIFIED

DOC STATUS: REVISION